



PROCEEDINGS OF THE NIGERIAN ACADEMY OF SCIENCE

OFFICIAL JOURNAL OF THE NIGERIAN ACADEMY OF SCIENCE

**THEMED EDITION ON SUSTAINABLE
DEVELOPMENT GOAL 14**



VOLUME 13, NO 2s, 2020

GUEST EDITORIAL

SDG 14 - life below water: trend and trajectory in Nigeria

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The United Nations Sustainable Development Goals 14 is focused on the conservation and sustainable use of the oceans, seas and marine resources. Specifically, target 14.1 is aimed at preventing and significantly reducing marine pollution of all kinds in particular from land-based sources including marine debris and nutrient pollution. Aquatic ecosystems in Nigeria are diverse including freshwaters, brackish and coastal waters as well as marine ecosystems. They support a diversity of animal species which serve as food for man and support ecosystem functioning. Furthermore, these ecosystems provide significant services to man including transport, abstraction of water for domestic and industrial use, power generation, reservoir of hydrocarbon deposits which has been the backbone of the Nigerian economy for over five (5) decades (Akinlo et al., 2012), food security, among others. However, the pollution of these ecosystems has been reported by many researchers over the years and remains the subject of studies to date. Aquatic ecosystems such as those in the Niger Delta, Lagos lagoon, Ogun River, River Onne, Calabar River, among others have been reported to have been subjected to various anthropogenic influences from point and diffuse sources with consequent adverse impacts on water quality, aquatic biota, other wildlife, livestock and even humans (Sogbanmu et al., 2016; Ubiogoro and Adeyemo, 2017; Ibor et al., 2017, Adeyemo et al., 2019).

The issue of aquatic pollution and aquatic water quality standards requires a closer look considering the changing environment in Nigeria. Hitherto, the Federal Ministry of Environment and National Environmental Standards and Regulations Enforcement Agency (NESREA) had adopted guidelines by the United States Environmental Protection Agency (USEPA) among other developed countries regulatory guidelines for most water quality parameters; which might not be applicable to Nigeria's situation. There is a need to set contextual standards for water quality parameters, priority pollutants (such as polycyclic aromatic hydrocarbons, heavy metals, BTEX, pesticides) and emerging contaminants (such as pharmaceuticals and personal care products, industrial additives) among others. These pollutants have been and continue to be detected in aquatic ecosystems in Nigeria at levels which are capable of eliciting adverse effects in aquatic life. The paucity of set limits for pollutants exacerbates the potential risk to aquatic biota, animal and human health. Furthermore, as a signatory to the United Nations Sustainable Development Goals (SDGs), Nigeria ought to develop and evaluate strategies to implement the targets of the SDGs including those stated for SDG 14 which is the focus of this themed edition of the Proceedings of the Nigerian Academy of Science.

Consequently, this themed edition contains Seven (7) peer-reviewed research articles, one (1) international perspective/review article. One (1) article presents water quality of an aquatic ecosystem

(River) in Nigeria impacted by abattoir activities, three (3) of the research articles were focused on adverse effects and biomarkers of toxicity in model and wild fish species in Nigerian aquatic ecosystems. Specifically, article 1 describes the adverse effects of ichthyotoxins used in Nigeria on a freshwater fish species, *Clarias gariepinus* (the African sharptooth catfish), article 2 presented information on biomarkers of oxidative stress in *Chrysichthys nigrodigitatus* (Bagrid catfish) sampled from heavy metals-contaminated Lagos lagoon, Nigeria. Article 3 reports human health risk associated with dietary intake of PAHs-contaminated *Oreochromis niloticus* (Nile Tilapia) from a tropical creek in Nigeria. Two (2) research articles recommended pollutant valorization and treatment to mitigate the adverse impact from their discharge into aquatic ecosystems. One (1) of the articles described the derivation of renewable energy from sewage sludge while the other reported the role of peroxidase in the efficient bioremediation of crude oil using indigenous *Bacillus* species. The international perspective/review paper provides an extensive exposé on the theme with up-to-date data on biomonitoring approaches, knowledge gaps and future research direction for monitoring, protecting and managing aquatic ecosystems. It provides a parallel on SDG 14 realization in developed countries vis-à-vis a developing country like Nigeria.

This themed edition is envisaged to challenge relevant stakeholders across relevant research institutions, government MDAs, regulatory agencies and policymaking institutions in Nigeria, international, regional and local development partners, non-governmental and civil society organizations to identify areas for collaborations, partnerships and innovation to support the sustainability of life below water in Nigeria.

Authors' contributions: TOS and OKA conceptualized the manuscript. Both authors read and approved the final manuscript.

Conflict of Interest: The authors declare no conflict of interest. OKA is the Editor while TOS is the Assistant Editor of the PNgAS Themed edition on SDG 14 – Life Below Water: Status, Current Trends and Future Direction in Nigeria.

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